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IS 12881 (1990): 36-Nickel Iron Soft Magnetic Strips [MTD 16: Alloy Steels and Forgings]

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IS 12881 : 1990
(Reaffirmed 2004)

Indian Standard

36-NICKEL IRON SOFT MAGNETIC STRIPS — SPECIFICATION

भारतीय मानक

36-निकल-लौह-मृदु चुम्बकीय पत्तियां — विशिष्टि

UDC 669·15’24 - 198 - 418

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

July 1990 **Price Group 1**

Special Metals and Alloys Sectional Committee, MTD 27

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 8 January 1990, after the draft finalized by the Special Metals and Alloys Sectional Committee had been approved by the Metallurgical Engineering Division Council.

36-nickel iron soft magnetic strip is used in electromagnetic purposes such as magnetic shields and the like of electrical machinery and apparatus. The requirements of 36-nickel iron soft magnetic rod and 48-nickel iron soft magnetic strip have been covered in IS 12836 : 1989 and IS 12882 : 1990 respectively.

While preparing this standard necessary assistance has been derived from Indian Telephone Industries Ltd, Bangalore.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

36-NICKEL IRON SOFT MAGNETIC STRIPS — SPECIFICATION

1 SCOPE

1.1 This standard covers requirements of cold rolled nickel iron alloy strips primarily intended for electromagnetic purposes such as magnetic shields and the like of electrical machinery and apparatus.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
IS 228 : (in various parts)	Methods for chemical analysis of steels (*second revision*)
IS 1387 : 1967	General requirements for the supply of metallurgical material (*first revision*)
IS 1501 (Part 1) : 1984	Method for Vickers hardness test for metallic materials: Part 1 HV 5 to HV 100 (*second revision*)

3 SUPPLY OF MATERIAL

3.1 The general requirements relating to supply of this material shall conform to IS 1387 : 1967.

3.2 Strips shall be supplied either in the form of coils or in straight lengths subject to mutual agreement between the purchaser and the manufacturer.

4 MANUFACTURE

4.1 The choice of manufacturing process is left to the supplier.

5 CHEMICAL COMPOSITION

5.1 The product analysis of the material when carried out either by the methods specified in relevant parts of IS 228 or any other established instrumental chemical method shall be as given in Table 1. The chemical composition is for reference only as long as other requirements called for in this specification are met.

6 FINISH

6.1 The iron nickel alloy strip shall be supplied in the bright rolled and soft condition.

7 FREEDOM FROM DEFECTS

7.1 The material shall be uniform in composition, sound, homogeneous, and free from physical defect or flaw both externally and internally.

8 HARDNESS

8.1 The hardness of the material shall be between 130 to 180 HV when tested in accordance with IS 1501 (Part 1) : 1984.

9 MAGNETIC PROPERTIES

9.1 After annealing as per manufacturers recommendations or at a temperature of 1 100 to 1 150°C in a protective hydrogen atmosphere, the material should meet the magnetic properties as given in Table 2.

10 DIMENSIONAL TOLERANCES

10.1 Unless otherwise specified the strips shall confrom to the tolerance limits given in Table 3 and Table 4.

11 SAMPLING FOR TESTS

11.1 One representative sample from a lot shall be taken for testing of properties. A lot shall consist of 5 tones or less of strip of the same quality rolled to the same thickness and condition. If the lot consists of more than one heat, samples from each heat shall be tested.

12 PACKING AND MARKING

12.1 Strips supplied in coils shall be in one continuous length. Each coil shall be suitably wrapped so as to prevent damage or deterioration during handling, transportation or storage. The coils shall be packed in wooden cases to avoid damage during transit. The usual size of the coil is 300 mm minimum internal diameter and a maximum weight of 25 kg. However, internal diameter and the maximum weight of the coil shall be mutually agreed upon between the parties.

12.2 The wooden cases shall be indelibly marked with the indication of the source of manufacture, weight, dimensions, batch number and description of the items.

Table 1 Chemical Composition

(*Clause* 5.1)

Constituent	Percent	
	Min	*Max*
Nickel	36·0	38·0
Carbon	—	0·075
Manganese	—	0·70
Other impurities	—	0·01
Iron	Remainder	

Table 2 Magnetic Properties

(*Clause* 9.1)

Coercive Force *Max* in A/cm	Ageing* Coefficient of Coercive Force in Percentage, *Max*	Minimum Values of Magnetic Flux Density, Microvolts per cm^2 (μ Vs/cm^2) for a Magnetic Field Strength (H) of					
		0·2A/cm (0·25 Oe)	0·5A/cm (0·63 Oe)	1A/cm (1·26 Oe)	3A/cm (3·8 Oe)	5A/cm (6·3 Oe)	40A/cm (50·5 Oe)
0·24 (0·3 Oe)	5	20 (2 000 gauss)	45 (4 500 gauss)	70 (7 000 gauss)	90 (9 000 gauss)	100 (10 000 gauss)	118 (11 800 gauss)

*Increase in coercive force value, after ageing for 100 hours at 100 ± 5°C, over the previous measured value.

Table 3 Permissible Variation on Thickness

(*Clause* 10.1)

Thickness (mm)	Tolerance on Thickness for Widths Given Plus or Minus (mm)		
	Under 75	76 to 150	151 to 225
Under 0·15	0·013	0·013	—
0·16 to 0·25	0·019	0·019	—
0·26 to 0·50	0·025	0·025	0·038
0·51 to 0·64	0·025	0·038	0·051
0·65 to 0·70	0·038	0·038	0·051
0·71 to 0·85	0·038	0·051	0·064
0·86 to 1·25	0·051	0·064	0·076
1·26 to 1·75	0·051	0·076	0·076
1·76 to 2·50	0·051	0·076	0·076
2·51 to 4·00	0·051	0·076	0·102

Table 4 Permissible Variation on Width

(*Clause* 10.1)

Thickness (mm)	Tolerance on Width Plus or Minus (mm)		
	4·5 to 12	13 to 150	151 to 225
Under 1·70	0·13	0·13	0·13
1·71 to 2·50	0·20	0·20	0·25
2·51 to 4·00	0·25	0·25	0·41

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